Scent Requires Direction: Toward an Evidence-Informed Framework for Applying Scent in Art and Cultural Heritage

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Abstract

This conceptual short paper proposes an empirical research framework for the evidence-informed application of scent in museums, galleries, and cultural heritage. It argues that scent should not be treated merely as a reconstructed sample, an informational object, or ambient diffusion. Instead, research should examine how its relations to other sensory modalities are temporally, spatially, semantically, and attentively organised. Sensorial Language—a practice-derived artistic methodology developed through long-term work with multisensory compositions—provides a source of hypotheses for this proposal, rather than a ready-made museum method. Its practical observations suggest that the role of scent changes according to its relations with sound, visual access, objects, materiality, touch, narrative, and bodily movement. The paper's contribution is to translate selected principles of sensory composition from artistic practice into candidate variables for empirical investigation. It proposes that these variables be tested, refined, and developed into a context-sensitive framework for the design and evaluation of olfactory interpretation in cultural settings. The proposal is situated in relation to multisensory causal inference, crossmodal correspondences, and olfactory–visual semantic congruence.

Keywords

olfaction, perception, multisensory integration, causal inference, sensory dramaturgy, Sensorial Language, art, cultural heritage

1 From scent reconstruction to an evidence-informed framework

Olfactory heritage research has established that smells can constitute culturally meaningful heritage through their connections with places, objects, practices, communities, and traditions [1]. It has also developed methods for identifying, analysing, documenting, archiving, reconstructing, and presenting historic odours [2]. Museums and heritage institutions increasingly use scents as reconstructed samples, labelled olfactory objects, narrative prompts, scent stations, or ambient diffusion. These approaches may make material and intangible dimensions of the past accessible beyond images and texts alone.

Yet historical identification or chemical reconstruction does not determine how a scent will function in an exhibition or artistic situation. A historically grounded scent may remain an isolated object of identification, become a generic atmospheric addition, compete with other information, or evoke associations unrelated to an intended interpretative context. Work in olfactory museology accordingly suggests that scent depends not only on historical grounding but also on narrative framing, visitor guidance, spatial conditions, delivery methods, and the broader design of the encounter [3, 4].

This conceptual short paper proposes an empirical research framework rather than reporting a completed experiment. Its contribution is not the general claim that multisensory presentation is preferable to isolated scent presentation. Rather, it proposes a systematic translation of practice-derived principles of sensory composition into operational variables that can be isolated, compared, and empirically tested. The aim is to support the later development of an evidence-informed, context-sensitive method for olfactory interpretation in museums, galleries, and cultural heritage.

2 Sensorial Language as a source of hypotheses

Sensorial Language is a practice-derived artistic methodology developed through approximately four decades of iterative artistic work, public presentations, audience feedback, and reflective refinement of multisensory compositions [5, 6]. Its candidate variables emerged through observations of how sensory relations were composed across varied situations, including differences in spatial organisation, temporal sequencing, sensory prominence, audience movement, narrative framing, and degrees of participant engagement. It was developed for artistic practice, not as a validated method for museums or heritage institutions. Its accumulated practice-based knowledge does not constitute controlled causal evidence, nor does it prescribe a ready-made museum method.

The relevance of Sensorial Language for the present proposal lies in its practical observations about sensory composition. In this practice, scent is used in relation to sound, visual conditions, objects, materiality, touch, lighting, temperature, textual and oral narrative, spatial organisation, bodily movement, and interpersonal communication. Its

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Information Society 2026, 5–9 October 2026, Ljubljana, Slovenia

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https://doi.org/10.70314/is.2026.cogni.76

perceptual role may vary with semantic reference, intensity, duration, temporal entry, spatial source, distance from the visitor, recurrence, and place in the attentional hierarchy of a situation.

These observations provide hypotheses and candidate variables for empirical investigation. The proposal is not that museums should adopt an artistic practice unchanged. Rather, selected practical insights should be operationalised, measured, tested, refined, and translated into an evidence-informed framework appropriate to museum, gallery, and heritage conditions.

This distinction is particularly important because artistic and heritage settings may pursue different interpretative aims. In artistic practice, deliberate sensory incongruence or counterpoint may be used to create tension, ambiguity, or new associations. In heritage interpretation, by contrast, an intentional departure from semantic or historical congruence should be explicit, justified, and evaluated in relation to the interpretative aim, available evidence, and visitor understanding.

3 Candidate variables for empirical research

The proposed research framework distinguishes several possible functions of scent. Scent may be presented as information to be identified; as a material or historical trace; as an atmospheric condition; as a contextual cue attached to an object, place, or narrative; or as a modality that participates in structuring attention, sequence, and bodily engagement. These functions may overlap, but they should not be assumed to produce identical visitor responses.

The central proposition is not that scent should always be embedded in a multisensory configuration. Rather, when the interpretative aim is to support semantic understanding, narrative reconstruction, or later recall, scent is hypothesised to be more effective when it is coordinated with relevant sensory and narrative cues than when it is presented only as an isolated informational sample or artefact. This proposition is a hypothesis to be tested empirically, not a conclusion drawn from the present paper.

For empirical purposes, sensory calibration should not mean an intuitive judgement that a composition "works." In the present proposal, it refers to specified and controllable relations among cues: for example, whether the scent and visual context are semantically congruent or incongruent; whether cues are temporally coordinated or uncoordinated; whether scent is delivered from a fixed, localised source or diffusely through a space; and whether the visitor can voluntarily engage with or avoid the scent. Calibration can therefore be described through variables rather than attributed solely to the judgement of a designer.

Candidate variables include semantic congruence; intensity and duration; temporal coordination; spatial source and distribution; distance and visitor control; visual access; acoustic and tactile context; narrative framing; visitor movement; recurrence; and the relative prominence of competing sensory information. Such variables make it possible to move from general claims about "adding scent" toward specific, comparable configurations.

The proposed framework does not assume that one configuration is inherently superior. An isolated and labelled scent may be appropriate when identification or material documentation is the aim. Ambient diffusion may be appropriate when an environmental context is intended, provided that its intensity, circulation, accessibility, and relation to other interpretative material are carefully considered. More explicitly directed multisensory configurations may be appropriate when the aim is to structure attention, sequence perception, activate narrative relations, or produce a situated bodily encounter.

The central research question is therefore: How do temporal, spatial, semantic, and attentional relations among sensory cues influence whether scent is integrated as a contextually meaningful component of a cultural event, experienced as an isolated object, or perceived as a competing stimulus?

The proposed hypothesis is that semantic congruence and temporal coordination will each contribute to more accurate semantic interpretation and better delayed recall. The strongest outcomes are expected when scent, visual context, and narrative framing are both semantically congruent and temporally coordinated, indicating a possible interaction between these factors. When these elements are incongruent or temporally uncoordinated, semantic interpretation and delayed recall are expected to be less accurate and less consistent.

4 Measuring and developing the framework

This question intersects with cognitive science because multisensory perception is not a simple accumulation of independent sensory signals. Perceivers must infer whether signals from different modalities arise from a common cause or from separate sources [7]. The integration or segregation of sensory cues depends on inferences about their likely relation, while temporal, spatial, semantic, and attentional factors may influence this process [7, 8]. Fundamental work on multisensory integration also emphasises that the combination of sensory cues may enhance, suppress, or otherwise alter responses, depending on the conditions of integration [9]. In olfaction, semantically congruent visual context can facilitate odour perception when identification is the relevant task [10].

Future empirical research should avoid changing all candidate variables simultaneously. Instead, it could first use controlled factorial comparisons. For example, semantic congruence could be varied as congruent versus incongruent, temporal coordination as coordinated versus uncoordinated, and mode of presentation as isolated scent versus multisensory context. Such comparisons would permit researchers to

estimate the contribution of particular relations, rather than attributing any observed difference to a globally "calibrated" composition.

A first study could prioritise three primary outcomes: odour identification or response time as an indicator of perceptual attention; semantic interpretation or narrative reconstruction; and delayed recall. Perceived pleasantness, emotional valence, sensory presence, accessibility, and discomfort could be collected as secondary outcomes. This narrower design would reduce the risk of uninterpretable multiple comparisons while retaining information about affective response and visitor experience.

Future designs should also record relevant individual differences and potential confounders, including anosmia or hyposmia, prior familiarity with the scent, cultural associations, age, previous exposure, and general odour-identification ability. Such factors may influence responses independently of the sensory configuration and should therefore be considered in sampling, analysis, or both.

The proposed research framework also acknowledges that exposure to scents may be inaccessible or uncomfortable for some visitors, including people with anosmia, respiratory sensitivities, or aversions to particular scents. Clear communication and the possibility of freely choosing whether to engage with scents should therefore be incorporated into the design of the installation from the outset.

The results could then be used to evaluate and refine the candidate variables derived from practice. The intended outcome is not a universal formula for scent use. It is an evidence-informed, context-sensitive method that helps cultural institutions decide whether scent is appropriate, what role it should have, how it should be delivered, which cues should support or contrast with it, and how its effects should be assessed for particular materials, narratives, spaces, and audiences.

5 Conclusion

This paper proposes that practical observations from Sensorial Language should be treated as a source of research hypotheses rather than as a completed method for museums, galleries, and cultural heritage. Its central contribution is a research pathway: practice-derived observations can be translated into measurable variables, tested through controlled comparative studies, and developed into an evidence-informed framework for olfactory interpretation.

The question for cultural institutions is therefore not simply whether scent should be present. It is how scent should be applied, evaluated, and adjusted in relation to space, time, objects, narrative, bodily movement, visitor agency, and other sensory modalities. A method developed through this process could support more deliberate, accessible, and contextually justified uses of scent in museums, galleries, and heritage settings.

Acknowledgments

This work was supported by the Slovenian Research and Innovation Agency (ARIS) under project J7-50233, Smell and Intangible Cultural Heritage.

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